UNIVERSITY OF JOHANNESBURG

NOVEMBER EXAMINATION

PROGRAM	:	**BACHELOR OF BIOKINETICS**
MODULE NAME	:	**BIOMECHANICS**
MODULE CODE	:	**BIM 01B1**
DATE	:	**28 NOVEMBER 2016**
DURATION	:	**TWO (2) HOURS**
TOTAL MARKS	:	**100 MARKS**

EXAMINER	:	**PROF L. LATEGAN**
MODERATOR	:	**MS L. VAN ROOY**
NUMBER OF PAGES	:	**THREE (3) PAGES**

INSTRUCTIONS TO CANDIDATES:

PLEASE MAKE SURE THAT YOU HAVE THE COMPLETE PAPER.

ANSWER ALL THE QUESTIONS PLEASE.

QUESTION 1 (6 MARKS)

Describe the dynamics of open-loop and closed-loop activities and provide examples of each activity that could occur in either a soccer or a rugby game.

QUESTION 2 (4 MARKS)

Why should a biokineticists have a sound knowledge of biomechanics?

QUESTION 3 (15 MARKS)

Describe Huxley's sliding filament theory of muscle contraction.

QUESTION 4 (8 MARKS)

Perform an anatomical analysis of the scapula-thoracic joint (shoulder girdle) during the downward phase of a military press (shoulder press) by using a table with the following headings: Joint, Movement, Agonistic Muscles, Type of Contraction.

QUESTION 5 (6 MARKS)

Discuss the role of Anthropometry in preventing disease and injury.

QUESTION 6 (6 MARKS)

Explain the knee's Q-angle, its normal values, and the consequences for an abnormally large value.

QUESTION 7 (16 MARKS)

Identify the plane and axis of rotation of the following movements and list each movements main or prime movers (agonistic muscles):

8.1 Knee flexion (6)

8.2 Upward rotation of the scapula (4)

8.3 Gleno-humeral horizontal abduction (6)

QUESTION 8 (6 MARKS)

Calculate the Power generated during the following activity: A man weighing 90kg lifted 20 boxes of 15kg each onto a shelf 1.5m above the ground in 5 minutes.

QUESTION 9 (8 MARKS)

Calculate the quadriceps force needed to hold an ankle weight of 12kg at an angle of 20**°** of knee flexion when seated on a chair. The ankle weight is positioned 45cm distally to the knee's axis of rotation and the perpendicular distance between the knee axis of rotation and the tibial tubercle is 5cm. ($T = F \times \perp d$)

QUESTION 10 (12 MARKS)

Explain the different classes of levers and give examples of where they occur in the human body.

QUESTION 11 (6 MARKS)

Explain what is meant by the terms "drag" and "lift" when coaching swimming.

QUESTION 12 (7 MARKS)

Explain the Magnus Effect and make it applicable to a sporting situation.

TOTAL: 100 MARKS